Remarks

Applicants have amended independent claims 13, 21, and 26, and have provided discussion below for distinguishing the present claims, as amended, from the art cited against them.

Clam Rejections - 35 USC § 103(a)

The rejection of claims 13-19 and 21-26 under 35 USC § 103(a) as being unpatentable over U.S. Patent No. 6,289,717 to Thundat et al. (hereinafter "Thundat '717") in view of U.S. Patent No. 6,016,686 to Thundat (hereinafter "Thundat '686") and U.S. Pub. No. 2005/0239047 to Gimzewski et al. (hereinafter "Gimzewski") is traversed.

Thundat '717 discloses a motion sensor having a microcantilever positioned to interact with a specimen in a fluid sample, including biological samples. However, Thundat '717 does not teach the use of a force transducing sensor to detect movement of motile specimens. Thundat '686 reference discloses the use of live biological specimens with the microcantilever, but depends on differences in surface charge to provide the force that is measured by the sensor. Both Thundat references rely on correlating data on things such as changes in hydrogen ion concentration or force from a chemical reaction to determine some information about a sample.

As acknowledged by the Examiner, neither Thundat '717 nor Thundat '686 discloses measuring a residence time and/or a motile frequency of a biological specimen on the cantilever. To overcome this noted deficiency, the Examiner cites to Gimzewski as disclosing an atomic force microscope (AFM) that includes a cantilever that continuously deflects and reverts back to its initial position in response to a series of mechanical forces exerted

upon it. Further, the Examiner asserts that FIG. 1 of Gimzewski clearly depicts that changes in the vertical displacement of the cantilever over time are measured.

Applicants respectfully traverse this assertion. Gimzewski discloses an AFM that includes a cantilever which rests on a membrane of a cell. Vertical movement of the membrane results in movement of the cantilever, as shown in FIG. 1. The detected movement of the membrane is then related to a cell characteristic. Notably, Gimzewski does not teach or suggest calculating the residence times of the motile specimens on the cantilever from motion of the cantilever or determining the characteristic motile frequency of the specimens by detecting the dynamic interaction of the cantilever via changes in a signal detected by a detector to facilitate measuring a concentration of the motile specimens in a medium. Moreover, Gimzewski does not disclose categorizing an interaction of the motile specimens with the cantilever as a result of the motion of the motile specimens as one of an impact, an oscillation, and a retention to facilitate identifying a binding behavior of the motile specimens.

As a result, it would not have been obvious to a person of ordinary skill in the art at the time of the subject invention to "use the Thundat '9717 system to measure the residence time and motile frequency of a plurality of successive biological analytes on the cantilever disclosed by Thundat," as asserted by the Examiner.

The method disclosed in claim 13, as amended, recites calculating the residence times of the motile specimens on the force transducing sensor surface coatings from the motion of the force transducing sensor, wherein an interaction of the motile specimens with the force transducing sensor as a result of the motion of the motile specimens is categorized as one of an

impact, an oscillation, and a retention to facilitate identifying a binding behavior of the motile specimens. As set forth above, no combination of Thundat '717, Thundat '686, and Gimzewski describes or suggests calculating the residence times of the motile specimens on the force transducing sensor surface coatings from the motion of the force transducing sensor. Accordingly, claim 13 is patentable over the combination of Thundat '717, Thundat '686, and Gimzewski. Claims 14-19 depend, directly or indirectly, from claim 13 and are also patentable for at least the reasons that claim 13 is patentable.

The method disclosed in the claim 21, as amended, recites determining the characteristic motile frequency of the specimens by detecting the dynamic interaction of the at least one force transducing sensor via changes in a signal detected by the detector to facilitate measuring a concentration of the motile specimens in the medium. As set forth above, no combination of Thundat '717, Thundat '686, and Gimzewski describes or suggests determining the characteristic motile frequency of the specimens by detecting the dynamic interaction of the motile specimens with the force transducing sensor. Accordingly, claim 21 is patentable over the combination of Thundat '717, Thundat '686, and Gimzewski. Claims 22-25 depend, directly or indirectly, from claim 21 and are also patentable for at least the reasons that claim 21 is patentable.

The method disclosed in claim 26, as amended, recites detecting a measureable characteristic of the motile specimens in accordance with the interaction with the force transducing sensor, wherein the interaction of the motile specimens with the force transducing sensor as a result of the motion of the motile specimens is categorized as one of an impact, an oscillation, and a retention to facilitate identifying a binding behavior of the motile

specimens. As set forth above, no combination of Thundat '717, Thundat '686, and Gimzewski describes or suggests detecting a measureable characteristic of the motile specimens in accordance with the interaction with the force transducing sensor. Accordingly, claim 26 is patentable over the combination of Thundat '717, Thundat '686, and Gimzewski.

For at least the reasons presented above, Applicants respectfully request that the rejection of claims 13-19 and 21-26 under 35 USC § 103(a) be withdrawn.

The rejection of claims 13-19 and 21-26 under 35 USC § 103(a) as being unpatentable over U.S. Patent Pub. No. 2003/0222232 to Welland et al. (hereinafter "Welland") in view of Gimzewski is traversed.

Welland discloses a detection means including a laser diode 1 and a photodiode 2 that receives inform by reflection from a planar member 3. The planer member 3 acts as a cantilever, and is mounted within a tube 4 defining fluid flow.

As acknowledged by the Examiner, Welland does not disclose using a sensor to measure a residence time and/or a motile frequency of contact motile specimens on the cantilever. To overcome this noted deficiency, the Examiner cites to Gimzewski as disclosing an atomic force microscope (AFM) that includes a cantilever that continuously deflects and reverts back to its initial position in response to a series of mechanical forces exerted upon it. Further, the Examiner asserts that FIG. 1 of Gimzewski clearly depicts that changes in the vertical displacement of the cantilever over time are measured.

Applicants respectfully traverse this assertion. As described above, Gimzewski discloses an AFM that includes a cantilever which rests on a membrane of a cell. Vertical movement of the membrane results in

movement of the cantilever, as shown in FIG. 1. The detected movement of the membrane is then related to a cell characteristic. Notably, Gimzewski does not teach or suggest calculating the residence times of the motile specimens on the cantilever from motion of the cantilever or determining the characteristic motile frequency of the specimens by detecting the dynamic interaction of the cantilever via changes in a signal detected by a detector to facilitate measuring a concentration of the motile specimens in a medium. Moreover, Gimzewski does not disclose categorizing an interaction of the motile specimens with the cantilever as a result of the motion of the motile specimens as one of an impact, an oscillation, and a retention to facilitate identifying a binding behavior of the motile specimens.

As a result, it would not have been obvious to a person of ordinary skill in the art at the time of the subject invention to "use the Welland system to measure the residence time and motile frequency of a plurality of successive biological analytes on the cantilever disclosed by Welland," as asserted by the Examiner.

The method disclosed in claim 13, as amended, recites calculating the residence times of the motile specimens on the force transducing sensor surface coatings from the motion of the force transducing sensor, wherein an interaction of the motile specimens with the force transducing sensor as a result of the motion of the motile specimens is categorized as one of an impact, an oscillation, and a retention to facilitate identifying a binding behavior of the motile specimens. As set forth above, no combination of Welland and Gimzewski describes or suggests calculating the residence times of the motile specimens on the force transducing sensor surface coatings from the motion of the force transducing sensor. Accordingly, claim 13 is patentable over the combination of Welland and Gimzewski.

Claims 14-19 depend, directly or indirectly, from claim 13 and are also patentable for at least the reasons that claim 13 is patentable.

The method disclosed in the claim 21, as amended, recites determining the characteristic motile frequency of the specimens by detecting the dynamic interaction of the at least one force transducing sensor via changes in a signal detected by the detector to facilitate measuring a concentration of the motile specimens in the medium. As set forth above, no combination of Welland and Gimzewski describes or suggests determining the characteristic motile frequency of the specimens by detecting the dynamic interaction of the motile specimens with the force transducing sensor. Accordingly, claim 21 is patentable over the combination of Welland and Gimzewski. Claims 22-25 depend, directly or indirectly, from claim 21 and are also patentable for at least the reasons that claim 21 is patentable.

The method disclosed in claim 26, as amended, recites detecting a measureable characteristic of the motile specimens in accordance with the interaction with the force transducing sensor, wherein the interaction of the motile specimens with the force transducing sensor as a result of the motion of the motile specimens is categorized as one of an impact, an oscillation, and a retention to facilitate identifying a binding behavior of the motile specimens. As set forth above, no combination of Welland and Gimzewski describes or suggests detecting a measureable characteristic of the motile specimens in accordance with the interaction with the force transducing sensor. Accordingly, claim 26 is patentable over the combination of Welland and Gimzewski.

For at least the reasons presented above, Applicants respectfully request that the rejection of claims 13-19 and 21-26 under 35 USC § 103(a) be withdrawn.

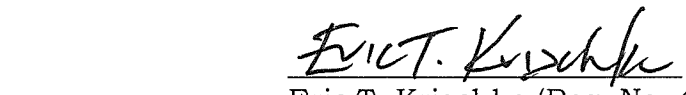
Conclusion

In view of the foregoing amendment and remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action are respectfully solicited.

Although the prior art made of record and not relied upon may be considered pertinent to the disclosure, none of these references anticipates or makes obvious the recited aspects of the invention. The fact that Applicants may not have specifically traversed any particular assertion by the Office should not be construed as indicating Applicants' agreement therewith.

The Commissioner is hereby authorized to charge any additional fees which may be required or to credit any overpayment to Deposit Account No. 501519.

Respectfully submitted,



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